Antonio Zea

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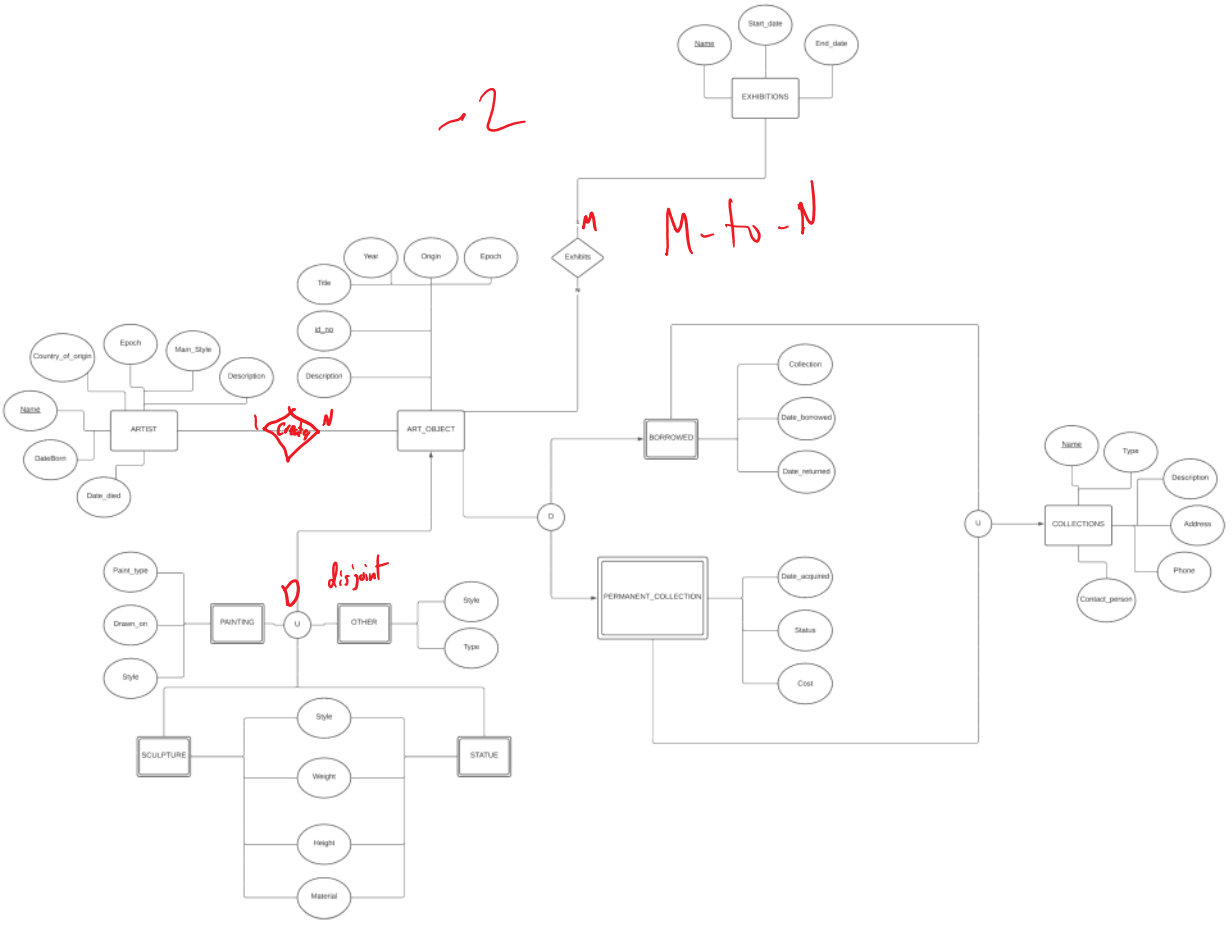
Fall 2021 PROJECT 1
Student name: Antonio Zea
Class (put your class either CS460 or CS580) : CS580
Date of your submission:09272021
Write your answers/paste image answers into existing table cells.

1) Design EER diagram for the narrative on Blackboard in the PDF:

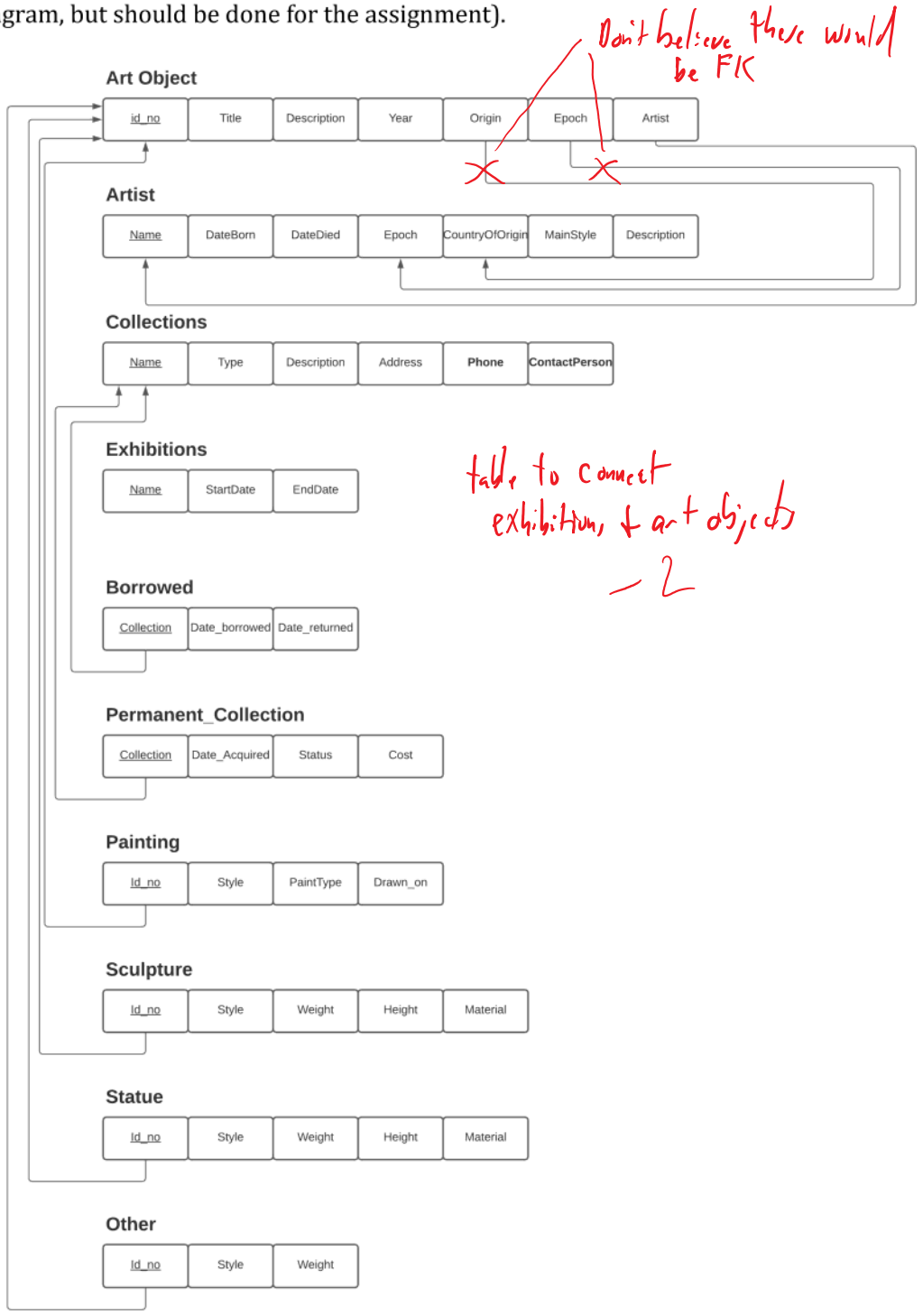
"RequirementsNarrative on page 276 example 8.20 in 6e.pdf"

Submit your EER diagram created by a diagram tool such as MS Visio (available on the CS Lab machines or via remote login to the CS Lab machines) or LucidChart.com.



2) Convert the EER schema from part 1 into database relations.

Submit a DB relations schema like the one on pg. 5 of the lecture "CS460-580-ER to Relational DB design.pdf" . Be sure to underline PK with straight line. Use Italic for foreign keys (not shown in that diagram, but should be done for the assignment).



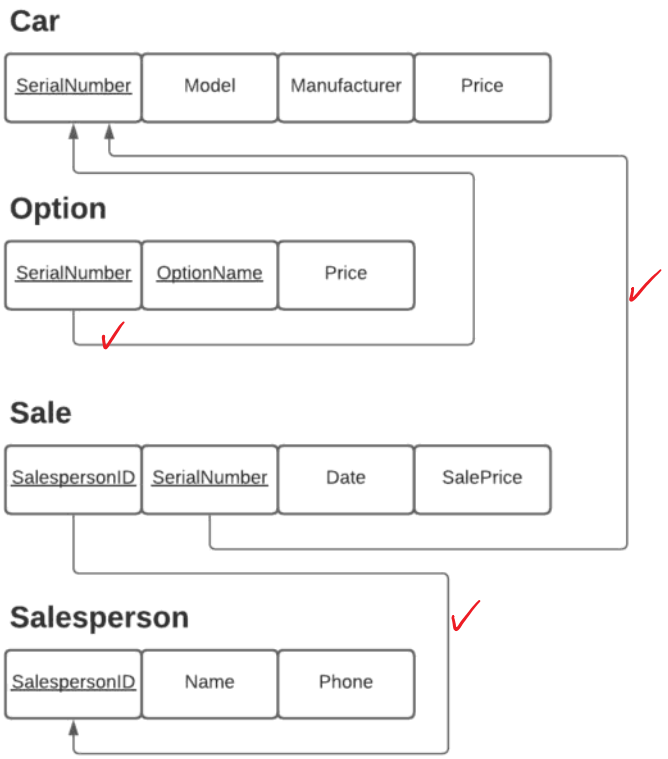
3) Consider the following relations for the database that keeps track of automobile

sales in a car dealership. OPTION refers to some optional equipment installed in a car.

CAR(SerialNumber, Model, Manufacturer, Price)
OPTION(SerialNumber, OptionName, Price)
SALE(SalespersonID, SerialNumber, Date, SalePrice)
SALESPERSON(SalespersonID, Name, Phone)

Produce diagram with arrows analogous to the one in question 2 above to display referential integrity constraints. Display diagrammatically referential integrity constraints by drawing the arrow directed from each foreign key toward the primary key of the relation it references.

ANSWER:



4) Consider the following relations for an order processing database:

CUSTOMER(Cust#, CustName, City)
ORDER(Order#, OrdDate, Cust#, OrdAmount)
ORDER_ITEM(Order#, Item#, Quantity)
ITEM(Item#, UnitPrice)
SHIPMENT(Order#, Warehouse#, ShipDate)
WAREHOUSE (Warehouse#, City)

Primary keys are underlined. OrdAmount is total dollar amount of an order. OrdDate is date the order was placed. ShipDate is date when order was shipped from the warehouse. An order can be shipped from several warehouses. Specify all foreign keys for this schema. For **each foreign key** specify referential integrity constraints in words. For example: ORDER.Cust# is foreign key and it refers to CUSTOMER.Cust#.

ANSWER:

ORDER.Cust# is foreign key and it refers to CUSTOMER.Cust#
ORDER_ITEM.Item# is foreign key and it refers to ITEM.Item#
ORDER_ITEM.Order# is foreign key and it refers to ORDER.Order#
SHIPMENT.Order# is foreign key and it refers to ORDER.Order#
SHIPMENT.Warehouse# is foreign key and it refers to WAREHOUSE.Warehouse#

5) For database schema in question 4 specify SQL DDL statements to define the

database (tables and constraints).

ANSWER:

```
CREATE TABLE CUSTOMER
   (CustNum              INT                  NOT NULL,
    CustName          VARCHAR(30)  NOT NULL,
    City                 VARCHAR(20)  NOT NULL,
    PRIMARY KEY (CustNum));

CREATE TABLE ORDER_
   (OrderNum          INT                  NOT NULL,
    OrdDate                DATE                 NOT NULL,
    CustNum               INT                  NOT NULL,
    OrdAmount          DECIMAL(6,2)  NOT NULL,
   PRIMARY KEY (OrderNum),
   FOREIGN KEY (CustNum) REFERENCES CUSTOMER(CustNum));

CREATE TABLE ITEM
   (ItemNum              INT                  NOT NULL,
    UnitPrice              DECIMAL(6,2)  NOT NULL,
    PRIMARY KEY (ItemNum));

CREATE TABLE ORDER_ITEM
   (OrderNum          INT                  NOT NULL,
    ItemNum               INT                  NOT NULL,
    Quantity              INT                  NOT NULL,
   PRIMARY KEY (OrderNum, ItemNum),
   FOREIGN KEY (OrderNum) REFERENCES ORDER_(OrderNum),
   FOREIGN KEY (ItemNum) REFERENCES ITEM(ItemNum));

CREATE TABLE WAREHOUSE
   (WarehouseNum     INT                  NOT NULL,
    City                 VARCHAR(20)  NOT NULL,
    PRIMARY KEY (WarehouseNum));

CREATE TABLE SHIPMENT
   (OrderNum          INT                  NOT NULL,
    WarehouseNum          INT                  NOT NULL,
    ShipDate              DATE                 NOT NULL,
   PRIMARY KEY (OrderNum,WarehouseNum),
   FOREIGN KEY (OrderNum) REFERENCES ORDER_(OrderNum),
   FOREIGN KEY (WarehouseNum) REFERENCES WAREHOUSE(WarehouseNum));
```

CS580 additional examples

6) For database schema in question 3 specify SQL DDL statements to define the database (tables and constraints).

ANSWER:

```
CREATE TABLE CAR
   (SerialNumber          INT                  NOT NULL,
    Model                 VARCHAR(20)  NOT NULL,
    Manufacturer          VARCHAR(20)  NOT NULL,
    Price                 DECIMAL(6,2)  NOT NULL,
   PRIMARY KEY (SerialNumber));

CREATE TABLE OPTION_
   (SerialNumber          INT                  NOT NULL,
    OptionName       VARCHAR(20)  NOT NULL,
    Price                 DECIMAL(6,2)  NOT NULL,
   PRIMARY KEY (SerialNumber, OptionName),
   FOREIGN KEY (SerialNumber) REFERENCES CAR(SerialNumber));

CREATE TABLE SALESPERSON
   (SalespersonID         INT                  NOT NULL,
    Name                  VARCHAR(30)  NOT NULL,
    Phone                 VARCHAR(10)  NOT NULL,
   PRIMARY KEY (SalespersonID));

CREATE TABLE SALE
   (SalespersonID         INT                  NOT NULL,
    SerialNumber          INT                  NOT NULL,
    Date_                 DATE                 NOT NULL,
    SalePrice             DECIMAL(6,2)  NOT NULL,
   PRIMARY KEY (SalespersonID, SerialNumber),
   FOREIGN KEY (SalespersonID) REFERENCES SALESPERSON(SalespersonID),
   FOREIGN KEY (SerialNumber) REFERENCES CAR(SerialNumber));
```